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EXAMINER

PHAM, THOMAS K

ART UNIT

PAPER NUMBER

2121

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,445

Applicant(s)

ERYUREK ET AL.

Examiner

Thomas K Pham

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Notice to Applicant(s)

1. Claims 1-35 of U.S. Application 10/085445 filed on 02/28/2002 are presented for examination.

DETAILED ACTION

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7, 12-32 and 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,533,413 (hereinafter Kobayashi).

Regarding claims 1 and 26

Kobayashi teaches

A method of using a degradation level of a process entity within a process plant, comprising:

- estimating a level of degradation of the process entity at a first time based on one or more process parameters associated with the process entity (col. 3 line 66 to col. 4 line 12, “an equipment state model ... life time state”);
- comparing the estimated level of the degradation of the process entity at the first time to a predetermined desired level of degradation of the process entity at the first time (col. 4 lines 23-26, “A comparison means .. from memory means 3”); and
- altering the operation of the process entity based on the comparison step to drive an estimated level of degradation of the process entity at a second time after the first time to

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be approximately equal to a predetermined desired level of degradation at the second time, wherein the predetermined desired level of degradation at the second time is greater than the predetermined desired level of degradation at the first time (col. 5 lines 46-52 “the equipment state model ... from model portion 1”).

Regarding claims 2, 18 and 29

Kobayashi teaches

- estimating the level of degradation includes using a model of the process entity to estimate the level of degradation of the process entity (col. 7 lines 9-20, “a deterioration model for ... may be delayed”).

Regarding claims 3, 19 and 30

Kobayashi teaches

- estimating, comparing and altering are repeated at various times during the operation of the process entity for different times (col. 6 lines 22-33, “Through the calculation ... reaches a predetermined value”).

Regarding claims 4, 20 and 31

Kobayashi teaches

- designating a fiducial line including a plurality of points, each point defining a predetermined level of degradation of the process entity at a different time and wherein the step of comparing includes the step of using the fiducial line to determine the predetermined desired level of degradation of the process entity at the first time and the step of altering the operation of the process entity includes using the fiducial line to

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determine the predetermined desired level of degradation at the second time (col. 6 lines 53-66, “the relationship between ... deterioration estimation”).

Regarding claims 5 and 21

Kobayashi teaches

- altering the fiducial line during operation of the process entity to thereby change the desired level of degradation at one of the first or second times (col. 8 lines 44-54, “A model or module ... to the respective graphs”).

Regarding claims 6, 22 and 32

Kobayashi teaches

- the fiducial line defines a plurality of points between a clean and a fouled condition of the process entity (col. 6 lines 53-66, “the relationship between ... deterioration estimation”).

Regarding claims 7 and 23

Kobayashi teaches

- altering includes using an optimization procedure to alter the operation of the process entity (col. 10 lines 56-62, “when deterioration model ... with reference to FIG. 13”).

Regarding claims 12, 24 and 27

Kobayashi teaches

- using a result of a comparison determined by the step of comparing to produce an index defining a utilization of the process entity (col. 7 lines 54-60, “A model correction ... extinguished or reduced”).

Regarding claims 13 and 25

Kobayashi teaches

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- altering includes the step of defining a line between the estimated level of degradation of the process entity at the first time and the predetermined desired level of degradation at the second time and using the defined line to alter the operation of the process entity (col. 8 lines 44-54, "A model or module .. respective graphs").

Regarding claim 14

Kobayashi teaches

- the step of using the defined line includes using the slope of the defined line (col. 9 lines 16-22, "Each module constituting ... stress S is increased").

Regarding claims 15 and 34

Kobayashi teaches

- collecting data indicative of the process parameters from multiple data sources (col. 7 lines 40-47, "A stress information ... deterioration model portion 1").

Regarding claims 16 and 35

Kobayashi teaches

- the step of collecting data includes collecting process control data and collecting process maintenance data (col. 7 lines 48-53, "A memory means 3 ... from memory means 3").

Regarding claim 17

Kobayashi teaches

A process control system adapted to use a degradation level of a process entity within a process plant that has a processor communicatively connected to multiple process devices, comprising:

- a memory (col. 4 lines 21-23, "A memory means 3 ... of the equipment");

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- a first routine stored on the memory and adapted to be executed on the processor to estimate a level of degradation of the process entity at a first time based on one or more process parameters associated with the process entity (col. 3 line 66 to col. 4 line 12, “an equipment state model ... life time state”);
- a second routine stored on the memory and adapted to be executed on the processor to compare the estimated level of the degradation of the process entity at the first time to a predetermined desired level of degradation of the process entity at the first time (col. 4 lines 23-26, “A comparison means .. from memory means 3”); and
- a third routine stored on the memory and adapted to be executed on the processor to determine an alteration for the operation of the process entity based on the comparison of the second routine to drive the estimated level of degradation of the process entity at a second time after the first time to be approximately equal to a predetermined desired level of degradation at the second time, wherein the predetermined desired level of degradation at the second time is greater than the predetermined desired level of degradation at the first time (col. 5 lines 46-52 “the equipment state model ... from model portion 1”).

Regarding claim 28

Kobayashi teaches

- altering includes the step of changing the operation of the process entity to drive the utilization index to be a predetermined amount at a second time after the first time (col. 5 lines 1-13, “Through calculation of ... predetermined threshold value”).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8-11 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Klimasauskas et al. U.S. Patent No. 5,877,954 (hereinafter Klimasauskas).

Regarding claims 8 and 33

Kobayashi teaches the step of estimating the degradation level within a process plant but does not teach a furnace within the process plant. However, Klimasauskas teaches a refinery or a chemical processing plant (col. 4 lines 40-43, "the representative plant is ... flow rate variables"). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate processing plant of Klimasauskas with the degradation level estimation of Kobayashi because it would provide for increasing the confidence of the user in the reliability and accuracy of the control system by estimating the degradation level of the furnace within a chemical processing plant.

Regarding claim 9

Klimasauskas teaches altering includes the step of changing a flow rate through the furnace (col. 4 lines 55-57, "The collected data ... by a flow meter 78").

Regarding claim 10

Klimasauskas teaches altering includes the step of changing a temperature associated with the furnace (col. 4 lines 47-55, "the collected data ... measured by analyzers").

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Regarding claim 11

Klimasauskas teaches altering includes the step of changing an amount of steam injected into the furnace (col. 4 lines 55-59, "The collected data ... controlled by a valve 86").

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner *Thomas Pham*; whose telephone number is (703) 305-7587 and fax number is (703) 746-8874, Monday-Thursday and every other Friday from 7:30AM- 5:00PM EST or contact Supervisor *Mr. Anil Khatri* at (703) 305-0282.

Any response to this office action should be mailed to: **Director of Patents and Trademarks Washington, D.C. 20231**, or **Hand-delivered** responses should be brought to **Crystal Park II, 2121 Crystal Drive Arlington, Virginia, (Receptionist located on the 4th floor)**, or fax to the **official fax number (703) 872- 9306**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Thomas Pham
Patent Examiner

TP

December 16, 2003


ANIL KHATRI
SUPERVISORY PATENT EXAMINER